REMARKS

Following the restriction requirement, claims 35-36 and 38-55 remained. The Examiner has withdrawn claims 41-45 as drawn to a non-elected sequence. Claims 37 and 56-57 of Group V were added to this Group by the Examiner to the extent they read on SEQ ID NOs: 5 or 6. Claims 35, 36, 38-40 and 46-57 are pending in the application.

Specification and other matters

The Examiner has not entered the substitute specification filed in May 2002 as it did not contain the preliminary amendment filed with the application, which included the priority information. The Examiner says that if priority is desired, reference to the earlier filed application must be made in this application. Further, the Examiner cites from the requirement that a priority request must be made within four months from filing of the application or sixteen months from the filing of the prior application or it will not be granted. The applicant has, however, properly requested insertion of the reference to the priority application in the previously filed amendment, which was filed before the expiration of either of the time frames, and was filed on the same day as the application. The subsequent filing of the substitute specification does not remove this timely-made request, and no rule or statute support removing a request for priority due to a substitute specification not including the reference to the priority application. Furthermore, MPEP 201.14(b)indicates that the paper indicating reference to a priority application need not take a particular form and the preliminary amendment provided the notice, as did the oath, which cited the application number and filing date on page 2, both of which were filed on the same day as the application. Such references provide the requisite notification of priority reference where the inventors are named and reference is made to an attached specification. Thus the priority reference notice was timely made.

The rules relating to substitute specifications indicate they "may be filed at any point up to the payment of the issue fee." 37CFR §1.125(b). Applicant submits herewith a new substitute specification, which includes the preliminary amendment reference to the priority application. Entry of the specification is requested.

The Examiner has requested that sequence identifiers be inserted in the Brief Description of Figure 6. Applicant has amended the specification to insert this reference.

After the description that the figure is "a comparison of the genomic BS92-7 sequence with the cDNA" has been added "SEQ ID NO: 3 and SEQ ID NO:1." A sequence listing has been previously submitted which included these sequences, and has not been indicated to be defective. Thus it is believed there has been full compliance with the sequence rules.

The abstract was found to not be descriptive. The Applicant has amended the abstract to recite that the invention is to a promoter providing male tissue-preferred expression in plants.

The title is also requested to be changed. A new title has been provided in this amendment.

Please note that the change to the abstract, title, and to page five, adding language in the drawing description, is made referencing the pages and line numbers of the substitute specification filed herewith. The chances of the present amendment have not been added in the substitute specification, as this amendment has not yet been entered. Applicant has provided a separate page for each of these changes, with a marked version and a clean version.

The Examiner has indicated the oath or declaration is defective as not identifying the application by the application number and filing date, citing MPEP §§ 602.01 and 602.02. The Applicant traverses, in that the MPEP indicates the oath is appropriate without identifying an application number where the inventors are named and reference is made to an attached specification. Only when the oath is filed after the filing of the application does the number need to be inserted. No application number could be provided at the time of the filing because no application number had yet been assigned. This section of the MPEP lists a combination of information which will suffice including "name of the inventor(s), and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration on filing." see MPEP §602 and 37 CFR §1.63. Thus it is submitted the declaration was sufficient.

Claim objections

The claims are objected to and changes requested to various punctuation marks and capitalization regarding the SEQ ID NOs. Such changes have been adopted in this amendment.

Section 101

The applicant also has inserted "An isolated" in claim 38 as suggested by the Examiner to alleviate the section 101 rejection (claim 37 is cancelled).

Section 112

The Examiner has rejected several of the claims under the second paragraph of section 112. Claim 35 is rejected as indefinite for reciting that it "encodes" the promoter region and this term has been removed. In claims 36 and 39 the conditions of high stringency have been inserted. These conditions are found in the specification at page 9, line 21.

Claims 35-37, 39-40 and 46-57 are rejected under section 112, first paragraph, with the Examiner saying the promoters of SEQ ID NO: 5 or 6 are enabled but those which hybridize to the sequences are not. The Examiner says the only examples are to the genomic clone, the cDNA clones and that the specification teaches only cloning the male tissue specific promoter, identification of an essential region, use of the promoter to drive expression of genes in order to confer male sterility in a plant, mapping of the gene to show it is allelic to ms7, and identification of another DNA from another species, sorghum, that can be amplified using primers based on the sequence.

The applicant respectfully traverses the rejection. As the Examiner has pointed out, the structure of the promoter is shown, both as cDNA, genomic DNA, and as obtained from both maize and sorghum. Its ability to drive genes such that the genes are preferentially expressed in male tissue is demonstrated. The steps of cloning the promoter and identification of the region which is essential to male tissue preferential expression is provided, with the structure shown in SEQ ID NO: 5 and 6. Identification of this region further adds to the ability to identify the structure which provides the promoter with male tissue preferential expression. The Examiner states that prediction of promoter sequences required for tissue specificity is unpredictable, citing Eyal et al, in

which a 30bp region of two tomato promoters are shown. The Examiner surmises that because that sequence which is thought to play an essential role in that specificity is not in the present promoter, this demonstrates unpredictability. However, various sequences can be effective in directing expression of a gene to male tissue, and to different parts of male tissue. They do not have to contain the same 30bp sequence of the tomato promoter of Eyal et al. in order to be effective at male tissue preferential expression. In fact, such a situation argues for the novelty and non-obviousness of the present invention. The present promoter and its essential region are unique. It has been demonstrated (as in Example 7) to be effective in preferentially expressing a cytotoxic gene to male tissue to provide male sterility in a plant. That it does not include the 30bp region of Eyal et al. does not negate this evidence, and shows that it is a unique effective male tissue expression region.

The applicant does not dispute the Examiner's comments that identification of the functional parts of promoters in unpredictable (citing Chen et al.) and that two promoters with similar expression patterns may have major differences in the expression elements required for expression in various flower parts. Further, applicant does not dispute that the region of a promoter with a particular activity is not predictable and that even a small region may be critical (citing Benfrey et al and Kim et al.). Once that region is identified, the structure provided, and the expression pattern demonstrated, as is provided here, unpredictability is removed. This is indeed the invention contributed here. The applicant has shown, as, for example, in Figure 9 and Example 5, linker scanning analysis shows that this region is essential for male tissue preferential expression.

Thus, applicant has taught an isolated nucleic acid sequence comprising the promoter region of the gene BS92-7 as recited in claim 1. Also taught is the sequence claimed in claim 36 to SEQ ID NO: 5 and those which hybridize under the recited stringent conditions. Applicant has added to this language that the sequence is one "which is essential for male tissue-preferred expression of the BS92-7 gene." This clarifies further that the sequence has the particular structure recited and retains the particular property recited. Claim 39 is similar, reciting SEQ ID NO: 6. Claims 46 and 56 are amended to refer to claim 39 and thus recite the same structure, as do the

dependent claims 47-55 and 57. Claims 37 and 40 are cancelled. Thus, all the present claims recite this particular structure, which has been demonstrated as the promoter of the BS-7 gene (SEQ ID NO: 5 and claim 36) and the essential region of the promoter (SEQ ID NO: 6 and claims 39, 46-57). Claim 35 recites the promoter of the BS92-7 gene, which has been fully taught in the specification.

The claims are also rejection under section 112, the Examiner stating the applicant has not described other DNA molecule encompassed by the claims and the structural features that distinguish it from other nucleic acids. The applicant respectfully traverses the rejection for the reasons outlined above, and because the structure is shown in the specification. The sequences are set forth, their source from more than one species is demonstrated, and the conditions of stringent hybridization are set forth in the specification and claims. Thus structure is known and provided. The interim written description guidelines suggest a similar result indicating in Example 9 that in showing the structure of a particular sequence that encodes a particular protein, there is adequate description to support a claim to that sequence and those that hybridize to it under highly stringent conditions. (See http://www.uspto.gov/web/menu/written.pdf). The comments analyze that "a person of skill in the art would not expect substantial variation among species encompassed within the scope of the claims because the highly stringent hybridization conditions set forth in the claim yield structurally similar DNAs. Thus, a representative number of species is disclosed, since highly stringent hybridization conditions in combination with the coding function of DNA and the level of skill and knowledge in the are adequate to determine that applicant was in possession of the claimed invention." Here, too, a person of skill in the art would not expect substantial variation among species included within the claims and the highly stringent hybridization conditions will yield structurally similar DNAs. Further, those sequences are recited in the claims to preferentially express a linked gene to male tissue in a plant. Both property and structure are provided.

The applicant has addressed the other comments of the Examiner to the claim language, by amending the claims to remove "encoding" in claim 35. In claims 36 and 39

the conditions of high stringency have been added to the claims, as supported by the specification beginning at page 9, line 21.

Claims 37 and 40 cancelled. Claim 56 is amended to recite the sequence of claim 39, which recites the sequence and those sequences which hybridize to it under highly stringent conditions. The language which was confusing to the Examiner regarding sequences "essential for initiating transcription of the BS92-7 gene" is removed.

Claim 46 is amended to refer to claim 39 instead of claim 37, and there is antecedent basis for the reference to a male tissue-preferred regulatory region.

Claim 47 is amended to recite an exogenous sequence instead of gene, thus removing confusion that a gene would imply a regulatory sequence associated with it.

Claim 48 is also clarified by adding that the promoter is selected from the "group consisting of the promoter of" those listed.

Clarification is also provided in the amendment to claim 51. A comma is added after the word "plant" to reflect that the term "comprising" modifies the method of the preamble, reference is made to claim 47 instead of 46 to provide antecedent basis for "the exogenous gene" and "the regulatory element in conjunction with the promoter." The term "control" is made plural and the term "impacts" is removed and replaced with the exogenous sequence inhibiting or restoring male fertility.

The extraneous mark in claim 53 is removed. Claim 54 is amended to recite the method of claim 53, which recites an inducible promoter/regulatory element. Claim 55 is amended to recite the method of claim 52 instead of claim 51 providing antecedent basis for the statements therein. Claim 56 recites the positive steps of producing a first plant, producing a second plant "and" crossing the first and second plant to produce hybrid seed. Claim 57 is amended to add that "the method further comprises" growing the seed to produce the third and fourth plants and cross-fertilizing.

For these reasons withdrawal of the section 112 rejections is requested.

Section 102

The claims are rejected under section 102 as anticipated by the sequences shown in several patents. Included is Van Tunen et al., US patent 6,005,167, which shows a male tissue-specific regulatory region which is a CIS-A anther box; Hodges et al, US

Patent 5,929,307 showing a core promoter linked to a male-tissue specific regulatory region; and Albertsen et al. US Patent 5,859,341 showing the MS45 promoter. The Examiner has concluded that the male tissue specific regulatory regions shown in these patents would inherently be essential for initiating transcription of the BS92-7 gene and would hybridize to SEQ ID NO: 5 or 6 under conditions of high stringency.

The applicant respectfully traverses the rejection. There is no basis to believe that these sequences would hybridize to the sequences of the invention under conditions of high stringency, and under the wash conditions set forth in the claims. In fact, examination of SEQ ID NO: 5 shows that it only has 56.25% homology with applicant's claimed sequences (9 of 16 bases), with a CG content of 33% within the gapped region of homology. A calculation of Tm for such an imperfectly matched DNA:DNA duplex using standard algorithms predicts a Tm of 27° C for this short region of homology and GC content. Therefore there would be no hybridization between SEQ ID NO: 5 of U.S. 6,005,167 and the applicant's claimed sequences under the stringency hybridization condition claimed.

In the same manner, examination of SEQ ID NO: 6 shows it to have only 32.14% homology with applicant's claimed sequences (9 of 28 bases), but with a higher CG content of 55.55% in the gapped region of homology. A calculation of Tm for such an imperfectly matched DNA:DNA duplex using standard algorithms predicts a Tm of 30° C for this short region of homology and GC content. Therefore there would be no hybridization between SEQ ID NO: 6 of U.S. 6,005,167 and the applicants' claimed sequences under the stringency hybridization conditions claimed herein.

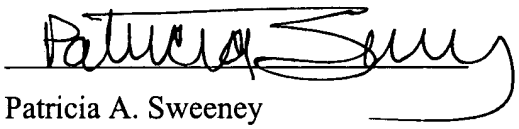
Similarly, the novelty rejection based upon based homology with previously disclosed sequences in U.S. 5,929,307 is not supported, since no sequences disclosed within U.S. 5,929,307 would hybridize to the applicant's claimed sequences at high stringency. Thorough comparison of all 4 sequences disclosed in U.S. 5,929,307 with the applicants' claimed sequences shows that no imperfectly matched DNA:DNA duplexes could be formed with sufficient homology to hybridize with any sequences in the present application at the stringency hybridization condition claimed herein. The same is also true of the MS45 promoter sequences shown in Albertsen et al., US Patent 5,859,341.

The sequences are new, and no evidence exists that previously existing sequences would hybridize under the highly stringent conditions as set forth in the claims. For these reasons withdrawal of the section 102 rejection is requested.

The Examiner has indicated claim 38 is free of the art and would be allowable if amended to overcome the rejections under section 112, which has been accomplished with this amendment.

For the foregoing reasons reconsideration and allowance of the claims is requested.

Respectfully submitted,



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